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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Shih-fu Chang, et al.

Serial No. : 09/530,308   Examiner : J.W. Desir

Filed : September 5, 2000   Group Art Unit: 2614

For : WATERMARKING OF DIGITAL IMAGE DATA

AMENDMENT

I hereby certify that this paper is being deposited
with the United States Postal Service as first class mail in
an envelope addressed to: Commissioner for Patents,
P.O.Box 1450, Alexandria, VA 22313-1450:

July 10, 2003
Date of Deposit

Paul A. Ragusa   38,587
Attorney Name   PTO Registration No
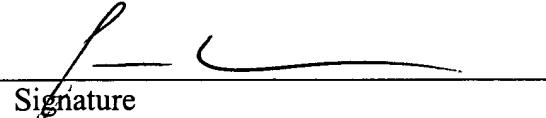
                                                   July 10, 2003
Signature   Date of Signature

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir or Madam:

The Applicants respectfully petition for a three month extension of time to respond to

the Office Action that was mailed on January 13, 2003. The applicable extension of time fee

(small entity) of $465.00 is enclosed herewith.

In the January 13th Office Action, the Examiner rejected each of pending claims 1

through 5 under 35 U.S.C. 102(b) as being anticipated by Cox, et al., "Secure Spread Spectrum

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Watermarking for Multimedia," NEC Research Institute, Technical Report 95-10, December 4, 1995 ("Cox"). The Applicants respectfully request reconsideration of this rejection.

Of the rejected claims, claim 1 is written in independent form. Claims 2 through 5 are dependent on, and thus include all of the limitations of, claim 1. Each of claims 1 through 5 recites, among its other limitations, "determining a *transformed representation of the watermark* for optimized visibility of the watermark in the image; and superposing *the transformed representation of the watermark* on the transformed representation of the image." (Emphasis supplied).

That is to say, each of the pending claims requires that a transform be applied to both the watermark and the image data, and that the transformed watermark be superposed on the transformed image data. For example, as is disclosed in the specification of the present application, a discrete cosine transform ("DCT") "is applied to obtain the DCT mask of the watermark . . . . Once the DCT blocks of the watermark have been obtained, they are inserted into the DCT frames of the input video . . ." Specification p. 4, lines 6-7; and p. 7, lines 9-11.

No such limitations are disclosed in, or suggested by, Cox. Rather, in Cox, a transform is applied to the image data alone; not to the watermark. As Cox explains, a frequency transform, such as a DCT, is first applied to the image data, which results in an $N \times N$ DCT matrix of the image. See Cox, at 11. A watermark of length n is then inserted into the n highest magnitude coefficients of the image's DCT transform matrix. Id. Nowhere in Cox is the application of a frequency transform to the *watermark* ever disclosed or suggested.

By contrast, claims 1 through 5 specifically require that a transformed representation of the watermark be superposed on a transformed representation of the image. Since this requirement is neither disclosed nor suggested by Cox, Cox neither anticipates claims 1 through

5, nor renders them obvious. Consequently, the Applicants respectfully request that the Examiner withdraw the rejection of the pending claims.

There is additional fundamental difference between claims 1 through 5 and Cox's disclosure. Claims 1 through 5 require "determining a transformed representation of the watermark *for optimized visibility of the watermark* in the image." That is to say, claims 1 through 5 recite a method for generating a watermark deliberately designed for *optimal visibility*. The embedded *visible* watermarks of the current invention may thus serve, for example, as a deterrent to copyright infringement.

By contrast, Cox is directed to generating *invisible* watermarks. Cox describes techniques to avoid perceptual degradation of the signal by placing watermark in perceptually significant components of a signal. Cox's goal is to make the embedded watermark invisible to the human eye. Thus Cox discloses the opposite of the present invention, in which the embedded watermark is made *optimally visible* by, for example, scaling the transformed representation of the watermark based on the characteristics of each image block (e.g., mean and variance), as specified in Equation (4) of the specification.

In view of the foregoing, the Applicants submit that all of the presently pending claims are in condition for immediate allowance. In the event that the present application is not deemed to be in condition for allowance, the Examiner is invited to contact the undersigned in an effort to advance the prosecution of this application.

Respectfully submitted,
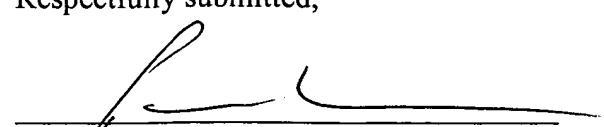
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